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Research of the desorption of propionic acid from the surface of polysorb

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Abstract

One of the actual directions of pharmaceuticals at present is targeted drug delivery. For oral administration of drugs into the body, compositions of sorbents and drugs are mainly used. Very often, finely dispersed silicon dioxide is used as a sorbent.

Propionic acid is used to reduce fat mass for overweight people. It is not mutagenic, carcinogenic and does not adversely affect reproductive organs. It is rapidly oxidized, excreted in the form of carbon dioxide and does not accumulate in the body. The only adverse effect associated with prolonged use of propionic acid alone is the development of esophageal ulcers. It`s connected with corrosive action of the acid. Therefore, it seems rational to use adsorbed propionic acid to reduce the negative effect. It is possible to use polysorb as a sorbent. It is a highly dispersed silica powder. Its advantages include a large specific surface area and good biocompatibility.

To establish the possibility of using polysorb for this purpose, studies on the adsorption interactions of propionic acid with its surface are required.

The aim of this work is to study the processes of desorption of propionic acid from the surface of polysorb and the influence (desorption) of various factors on it.

In this work, we study the kinetics of desorption of propionic acid from the surface of polysorb at temperatures of 283, 295, and 313 K. It is shown that the desorption value increases with increasing temperature, which indicates the endothermic nature of the process. The kinetics of desorption was described using pseudo-first (Lagergren) and pseudo-second (Xo) order models. It is shown that desorption is adequately described by the Lagergren model. Determined the value of the apparent activation energy. It was 46.1 kJ / mol. The effect of hydrochloric acid on the desorption of propionic acid from the silica surface was studied. It was shown that with an increase in the concentration of hydrochloric acid, the desorption of propionic acid increases.

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